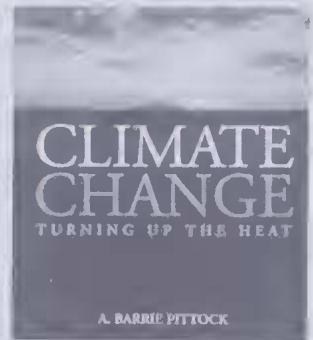


## Climate change: turning up the heat

by A Barrie Pittock

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Yes, there's another book on climate change – and no wonder, it's serious stuff. Adding to the now hefty weight of literature on the climate and our future is this outstanding contribution from an expert in the field: Barrie Pittock has been a leading researcher of climate change with CSIRO and served on the Intergovernmental Panel on Climate Change (IPCC). The author's credentials give this book a unique perspective on the problems we face and how they might be addressed. It stands out as a book that offers lucid explanations of fact, uncertainty, risk and climate science. Discussed are environmental changes wrought by excessive consumption and overpopulation, and how these will affect the environment and we humans that depend on it – probably in a very inequitable way. This is also a solutions book that speaks to you and me, and policymakers.

In the chapter 'Learning from the past', the reasons for past climate changes (e.g. variations in Earth's orbit, solar output, and volcanic eruptions) and the lessons we can learn from them are discussed. These changes are often cited as a reason for complacency (*if people survived these in the past, why not in the future?*), but the author reminds us that this ignores our now very different place in the environment. For example, large populations are unable to migrate across national boundaries, and we have mass reliance on relatively few food crops; also, the 'climate change that we can expect in the next 100 years has happened before, but at a much slower rate and from a cooler starting point'.

The chapter title, 'Uncertainty is inevitable, but risk is certain', as noted in the foreword, is an erudite comment on the heart of the climate change debate; the chapter itself details why we cannot ignore the

overwhelming, though to some extent uncertain, evidence of anthropogenic climate change. We deal with uncertainty every day and don't generally ignore it: we wear seatbelts to *reduce* the risk of serious injury in the *rare* event of an accident. The IPCC estimated that by 2100 global CO<sub>2</sub> concentrations will be 75 – 350% higher than pre-industrial values, leading to an increase in temperature of 1.4 – 5.8 °C and consequent sea-level rises of 9 – 88 cm. Because these are broad ranges, and indeed estimates, the author helpfully outlines how we estimate risk and measure climate change; e.g. how reliable are temperature measurements from within cities compared to those from satellites? The issue of uncertainty is a strong theme of the book at two levels: in science (how much climate change will there be?) and in future human and societal behaviour (how well will we cope with reducing our emissions?).

'Impacts: why be concerned?' explains why we should be deeply worried if even only the minimum estimates of temperature increase are realised. Here, Pittock quotes from the IPCC on: risks to threatened environments and biodiversity (the Great Barrier Reef already is showing signs of its likely demise – not only will we lose a cherished soul-enriching habitat, but we should remember that the reef also enriches the Australian economy by \$1 to 2 billion, *each year*); risks from extreme weather events (damages to ecosystems, crops [why are our North Queensland bananas so expensive now?] and society); inequitable distribution of impacts (the poor [in low-latitude, developing countries] will suffer most as their lands become too hot and dry for habitation); risks from large-scale discontinuities such

as melting of the Greenland and West Antarctic Ice Sheets (many heavily populated coastal areas would be flooded).

'Living with climate change' discusses the many things we'll have to do to adapt, and highlights the inequity of these forced adaptations. 'There are equity issues...since adaptation is necessary for people that are affected by climate change, but not necessarily for those who have caused it'. A familiar example is the Pacific islanders who will have to evacuate their submerged homelands because of the changes caused by industrialised nations: who should pay for this?

As well as *adaptation*, we must practise *mitigation* of climate change ('Limiting climate change', chapter 8) by reducing greenhouse gas emissions. This need not be expensive - huge savings can be made by being more efficient. Mitigation is especially important as, even with minimum estimates of climate change (a global rise of 2–3 °C before the end of this century), adaptation will be extremely costly and often impossible to implement. Most alarmingly, however, without mitigation, irreversible changes will be set in train that may not be apparent until it is too late (if it isn't already): for example, the thawing of the Arctic tundra would release huge amounts of CO<sub>2</sub> and methane leading to further, accelerated warming; as would the melting of the ice sheets through the consequent lack of solar reflection that these white expanses now provide.

What can we do about it? The obvious switch to non-fossil fuels is thoroughly aired, with the advantages and disadvantages of wind, nuclear, hydrogen, etc well discussed. Pittock notes that truly renewable and essentially harmless means of energy generation, such as wind power, are few; and I note that Victorian naturalists should not be quiet while dubious cases, such as that of the orange-bellied parrot, are argued against the erection of wind turbines.

Climate change is put in context with other pressing problems of fresh water, ozone, atmospheric pollution, overpopulation and security issues, and the conclusion is drawn that all are, of course, linked. Pittock points out that greenhouse gas emissions are essentially a problem of overpopulation, but with the vast burden of emissions coming from the developed countries. Thus, 'the population issue boils down to one of sustainable development';

'population issues and climate policy need to be linked' – but, since populations generally decline over generations (long-term) urgent reductions in emissions per person (in the west) need to be enacted now.

A chapter on the politics of climate change gives a fascinating glimpse into negotiations in the IPCC and deals with much more besides, under headings such as 'what about the uncertainty?', 'how realistic are the scenarios?', 'choosing emissions targets' and 'how urgently do we need to act?'. It is noted that in choosing emissions targets and how we adapt, we face huge ethical issues around which people or fauna and flora will survive increasing temperatures, rising oceans, more intense storms etc. The author also considers how climate change will affect different countries and what specific nations can do to mitigate global greenhouse gas emissions; he looks at Canberra's reasons for not signing the Kyoto protocol and provides well-reasoned and fact-based counter arguments.

The author often quotes from literature and IPCC reports. Useful headings and bulleted summaries afford a quick grasp of the main points, or the reader can spend time with Pittock's lucid, well-referenced discussions. The 'sources of information' section cites reports, texts, papers and, importantly, categorised websites (e.g. government agencies, NGOs, renewables...). It's a little repetitive in parts, but this allows sections to be read in isolation and it can act as a useful, well-indexed reference book.

This is a disturbing book, but provides an impetus for change, and tolerance in the light of the changes we face. In the closing chapter, 'Accepting the challenge', the author adds a note of optimism: 'It is not about doom and gloom ... but exciting technologies, creating new markets, opportunities for investments ... solving several problems at once ... enjoying our relationship with nature and creating a sustainable future. It is about making life better.' My view is that we're going to need strong, honest politicians to make sure we have more than a short-term view of what's good for us, and what's right for the rest of Earth's inhabitants.

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